



REPLY TO  
ATTENTION OF

**DEPARTMENT OF THE ARMY**  
**NEW ENGLAND DISTRICT, CORPS OF ENGINEERS**  
**696 VIRGINIA ROAD**  
**CONCORD, MASSACHUSETTS 01742-2751**

January 30, 2013

Engineering/Planning Division  
Geo-Environmental Engineering Branch

Ms. Lynne Jennings  
EPA - New England, Region 1  
5 Post Office Square - Suite 100  
Mail Code OSRR7-3  
Boston, Massachusetts 02109-3912

Mr. Len Pinaud  
Commonwealth of Massachusetts  
Department of Environmental Protection – Southeast Regional Office  
20 Riverside Drive  
Lakeville, Massachusetts 02347

Re: Impact Area Groundwater Study Program (IAGWSP), Former K Range Interim  
Environmental Monitoring Report, Sampling Year 2012, dated January 2013

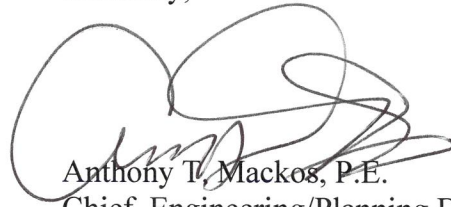
Dear Ms. Jennings and Mr. Pinaud:

On behalf of the Army National Guard's Impact Area Groundwater Study Program (IAGWSP), the U.S. Army Corps of Engineers (USACE) is pleased to provide the Final version of the subject report.

The Draft version of this document was submitted in August 2012. Comments were received from the U.S. Environmental Protection Agency (EPA) in a letter dated December 18, 2012, and from the Massachusetts Department of Environmental Protection (MassDEP) in a letter dated August 27, 2012. A Response to Comments Letter (RCL) was written on January 16, 2013. EPA and MassDEP approved the RCL in letters dated January 22, and 24, 2013, respectively. A signed Project Note (Former K Range Groundwater Monitoring Discontinuation), which summarizes the approved changes to the chemical monitoring well network is included as Appendix A of this report.

Please contact Dave Hill of the IAGWSP, or Mark Anderson of the USACE, if there are any questions.

Sincerely,

A handwritten signature in black ink, appearing to read 'Anthony T. Mackos', is written over the printed name.

Anthony T. Mackos, P.E.  
Chief, Engineering/Planning Division

Encls

EPA 1 copy and 1 CD

MassDEP 1 copy and 1 CD

Copy Furnished:

IAGWSP: Ben Gregson (letter only), Dave Hill (1 copy), and Marcia Goulet (5 copies and 2 CDs)

EPA: Bob Lim (1 copy), Desiree Moyer (1 copy), Erin Sanborn (1 CD)



## **Impact Area Groundwater Study Program**

*FINAL*

# **Former K Range Interim Environmental Monitoring Report Sampling Year 2012**

**Camp Edwards  
Massachusetts Military Reservation  
Cape Cod, Massachusetts**

**January 2013**

*Prepared for:*

Army National Guard  
Impact Area Groundwater Study Program  
Camp Edwards, Massachusetts

*Prepared by:*

U.S. Army Corps of Engineers  
New England District  
Concord, Massachusetts

## **DISCLAIMER**

This document has been prepared pursuant to government administrative orders (U.S. EPA Region I SDWA Docket No. I-97-1019 and 1-2000-0014) and is subject to approval by the U. S. Environmental Protection Agency. The opinions, findings, and conclusions expressed are those of the authors and not necessarily those of the Environmental Protection Agency.

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                    Discontinuation

## 1.0 INTRODUCTION

The Former K Range site is among several training areas and ranges at the Massachusetts Military Reservation that were initially investigated under Phase IIb of the Impact Area Groundwater Study Program (IAGWSP). This 27-acre training site is located on Greenway road, between the J-2 Range and Wood Road (Figure 1-1). The range is active, but currently not in use. Historical records indicate that it was used for 3.5-inch rocket, 40mm grenade launcher, and portable missile launcher training during the 1960s and 1970s.

As part of early IAGWSP investigation activities, well cluster MW-170 was installed on Wood Road to monitor groundwater quality downgradient of the Former K Range target area (Figure 1-2). Three depth intervals were selected for monitoring and wells MW-170M1, M2, and M3 were installed in 2001. With the exception of a trace (0.064J µg/L) detection of perchlorate found in MW-170M2 in 2009, no other range-related contamination has been observed in these wells since the inception of sampling. Regional groundwater profile and drive-point samples also demonstrate an absence of groundwater contamination originating from this site. A more comprehensive presentation of Former K Range investigation findings is provided in the *Final Former K Range Investigation Report (IR)* (ECC, 2011).

Wells MW-170M2 and MW-170M3 continued to be sampled through 2011 under the IAGWSP as part of the interim groundwater monitoring plan established for Former K Range, and laboratory results were documented in a series of summary reports; the most recently published one, entitled *Final Former K Range Interim Groundwater Monitoring Report Sampling Year 2011* (USACE, 2012), covers groundwater results for sampling year 2011. MW-170M3 was removed from the Former K Range monitoring network pursuant to a Project Note dated 7/28/2011. Results for the sample collected in 2012 are presented herein.

Based on sampling results and removal actions presented in the remedial investigation report (ECC, 2011) for the site, it was determined that no further action is necessary with regard to the source area and groundwater at the Former K Range. The selected decision described in the *Final Decision Document* (USEPA, 2012), that no further action is necessary, is protective of human health based on findings that indicate that there is no groundwater contamination and that removal actions conducted at the site removed any soil contamination that could be a source of continuing groundwater contamination.

## **2.0 SAMPLING PROGRAM**

From 2006-2011, groundwater monitoring at Former K Range was conducted in accordance with the *Draft Former K Range Interim Groundwater Monitoring Plan Project Note* (IAGWSP, 2005). Under that plan, samples were collected annually from wells MW-170M2 and MW-170M3 and analyzed for explosives and perchlorate. However, in following with the approved change to the sampling program described in the July 2011 Project Note included as Appendix A of this report, the most recent sampling round included collection of a groundwater sample from well MW-170M2 only (Table 2-1). This current sampling event was conducted on June 1, 2012. The sample was analyzed for explosives compounds using EPA Method 8330 and perchlorate using EPA Method 6850.



### **3.0 MONITORING RESULTS**

Laboratory results for the 2012 sample are summarized in Table 3-1. These data were compared to past groundwater results, and notable observations are presented below. Analytical data has been validated according to the *Final IAGWSP Generic Quality Assurance Project Plan* (QAPP; Tetra Tech, 2012). Associated data packages and data validation reports are accessible on the Massachusetts Military Reservation (MMR) Electronic Data Management System (EDMS).

#### **3.1 Explosives**

No detectable concentrations of explosives compounds were found in MW-170M2 in 2012. These findings are consistent with past results where no explosives have been reported in 13 consecutive sampling rounds dating back to the inception of sampling in 2001.

#### **3.2 Perchlorate**

Perchlorate was not detected in groundwater collected from MW-170M2 during the reporting period. Excluding a trace detection (0.064J µg/L) reported in MW-170M2 in 2009 (as a result of the lower detection limit under newly implemented SW-846 method 6850), the 2012 results are consistent with the long sequence of non-detects reported for both MW-170M2 and MW-170M3 since perchlorate sampling began in 2001.

## **4.0 RECOMMENDATIONS**

Groundwater monitoring results for 2012 show that well MW-170M2 continues to be free of range-related contamination. These findings are consistent with past results where no explosives or significant perchlorate detections have been reported in 13 consecutive sampling rounds dating back to the inception of sampling in 2001. Based on the consistently observed absence of range-related groundwater contamination, the IAGWSP recommends that all groundwater monitoring activities at the Former K Range be discontinued. This is consistent with the selected remedy for Former K Range, as stated in the *Final Decision Document* (EPA, 2012), that no further groundwater monitoring is required. The approved change to the monitoring well network (groundwater monitoring discontinuation) is described in the Project Note included as Appendix A of this document.

## 5.0 REFERENCES

ECC, 2011. *Final Former K Range Investigation Report*. Impact Area Groundwater Study Program, Massachusetts Military Reservation, Cape Cod, Massachusetts. Prepared by ECC for the U.S. Army Corps of Engineers, New England District, Concord, Massachusetts. 2011.

IAGWSP, 2005. *Draft Former K Range Interim Groundwater Monitoring Plan Project Note*. Impact Area Groundwater Study Program, Massachusetts Military Reservation, Cape Cod, Massachusetts. December 20, 2005. (EDMS Document ID 8378)

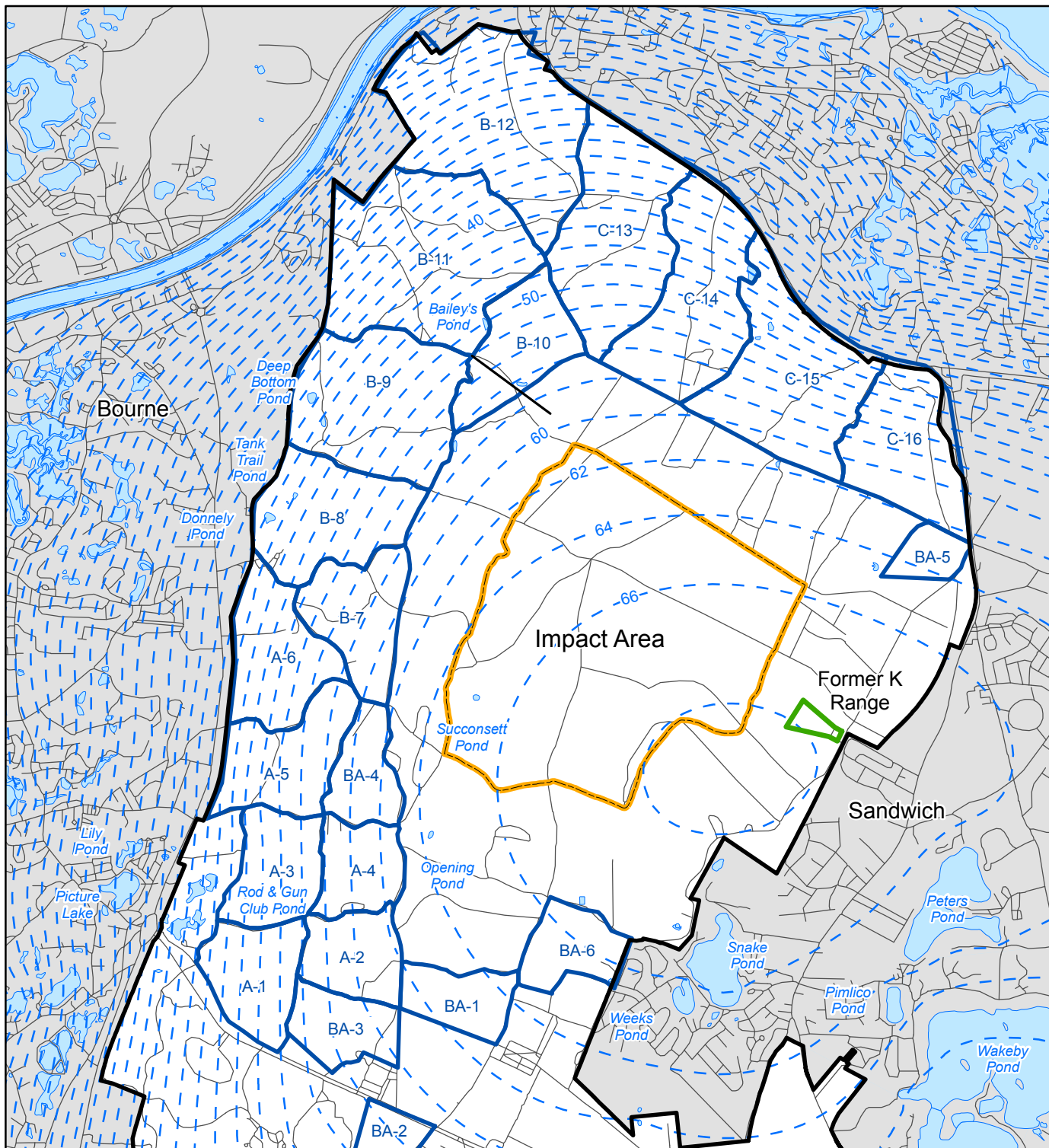
Tetra Tech, 2012. *Final IAGWSP Generic Quality Assurance Project Plan*. Impact Area Groundwater Study Program, Massachusetts Military Reservation, Cape Cod, Massachusetts. Prepared by Tetra Tech EC, Inc. February, 2012. (EDMS Document ID 113291)

USACE, 2011. *Final Former K Range Interim Groundwater Monitoring Report – Sampling Year 2010*. Impact Area Groundwater Study Program, Massachusetts Military Reservation, Cape Cod, Massachusetts. Prepared by U.S. Army Corps of Engineers, New England District, Concord, Massachusetts. June 29, 2011. (EDMS Document ID 111268)

USACE, 2012. *Final Former K Range Interim Groundwater Monitoring Report – Sampling Year 2011*. Impact Area Groundwater Study Program, Massachusetts Military Reservation, Cape Cod, Massachusetts. Prepared by U.S. Army Corps of Engineers, New England District, Concord, Massachusetts. March 21, 2012. (EDMS Document ID 113293)

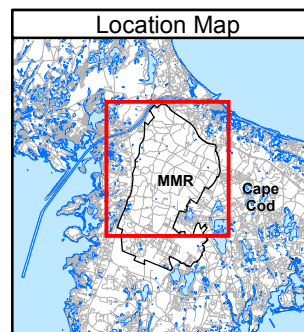
USEPA, 2012. *Final Decision Document, Former A Range, Former K Range, and Gun and Mortar Positions*. US Environmental Protection Agency, Region 1. September 2012 (EDMS Document ID 114801).

## FIGURES



#### Legend

- MMR Boundary
- Impact Area Boundary
- Training Areas
- Former K Range Site Boundary
- Groundwater Elevation Contours**  
(in feet above NGVD)
- Water Level Contours - MMR10



0 2,500 5,000  
Feet



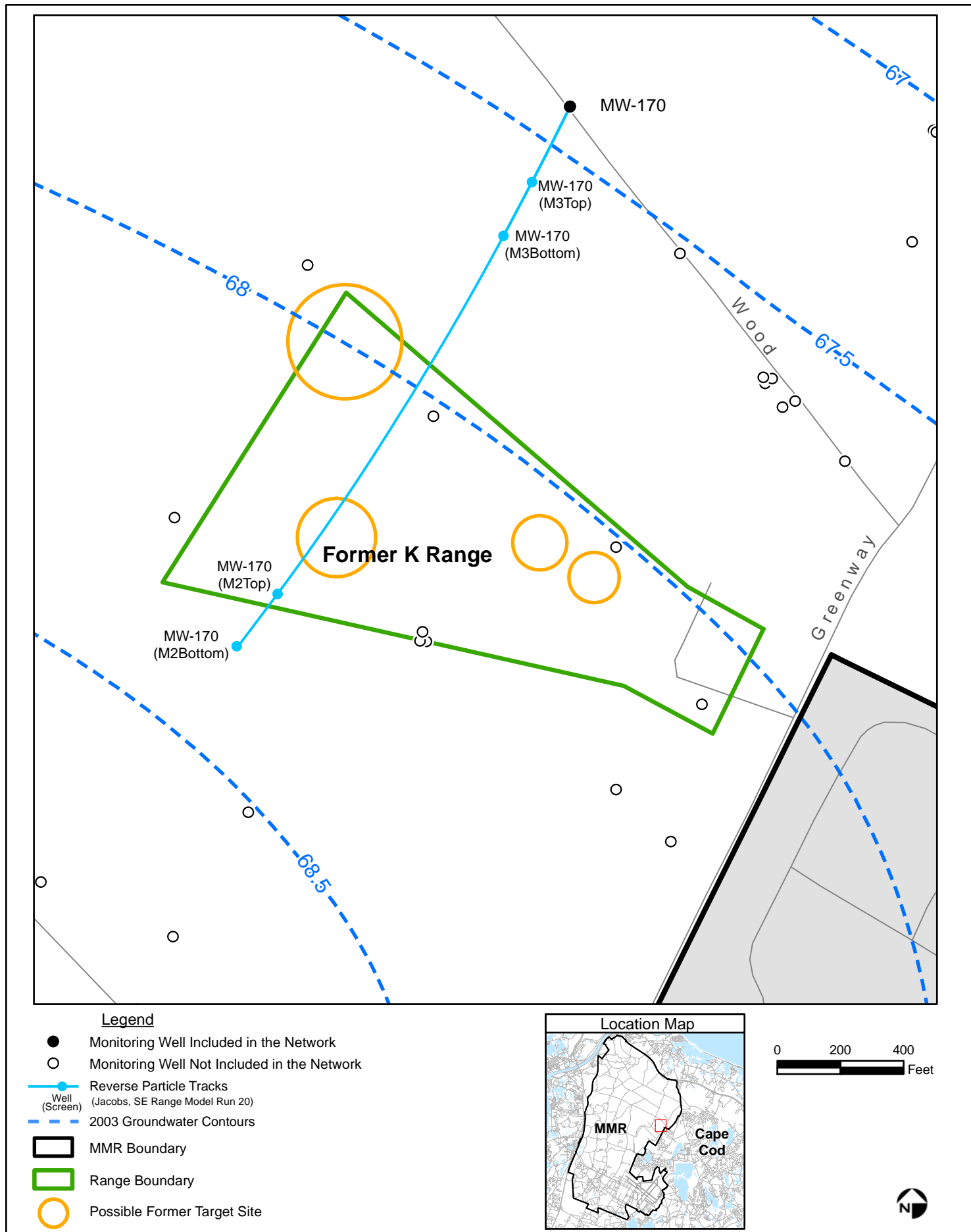
DRAFT

Location of Former K Range

FIGURE

1-1





Former K Range Groundwater Monitoring Well Network

FIGURE

1-2

## TABLES

**Table 2-1**  
**Former K Range - Groundwater Monitoring Well Network**  
**2012 Reporting Period**

Location	Northing (utm - meters)	Easting (utm - meters)	Ground Elevation (ft msl)	Screen Top Elevation (ft msl)	Screen Bottom Elevation (ft msl)	Groundwater Elevation on 6/1/2012 (ft msl)	Sample Collection Frequency	Tested Parameters
MW-170M2	4618618.02	374574.59	175.13	-22.87	-32.87	71.32	Annual	Explosives & Perchlorate

Notes:

utm = universal transverse mercator

ft msl = feet above mean sea level



**Table 3-1**  
**Former K Range - Groundwater Monitoring Results**  
**2012 Reporting Period**

Well ID	Sampling Date	Sample Type	Lab Method	Analyte	Result (µg/L)	MDL	RL
MW-170M2	05/19/2011	N	SW6850	Perchlorate	ND	0.015	0.2
MW-170M2	05/19/2011	N	SW8330	1,3,5-Trinitrobenzene	ND	0.015	0.2
MW-170M2	05/19/2011	N	SW8330	1,3-Dinitrobenzene	ND	0.025	0.2
MW-170M2	05/19/2011	N	SW8330	2,4,6-Trinitrotoluene	ND	0.012	0.2
MW-170M2	05/19/2011	N	SW8330	2,4-Diamino-6-Nitrotoluene	ND	0.031	0.2
MW-170M2	05/19/2011	N	SW8330	2,4-Dinitrotoluene	ND	0.059	0.2
MW-170M2	05/19/2011	N	SW8330	2,6-Diamino-4-Nitrotoluene	ND	0.031	0.2
MW-170M2	05/19/2011	N	SW8330	2,6-Dinitrotoluene	ND	0.019	0.2
MW-170M2	05/19/2011	N	SW8330	2-Amino-4,6-Dinitrotoluene	ND	0.021	0.2
MW-170M2	05/19/2011	N	SW8330	2-Nitrotoluene	ND	0.032	0.2
MW-170M2	05/19/2011	N	SW8330	3-Nitrotoluene	ND	0.057	0.2
MW-170M2	05/19/2011	N	SW8330	4-Amino-2,6-Dinitrotoluene	ND	0.022	0.2
MW-170M2	05/19/2011	N	SW8330	4-Nitrotoluene	ND	0.055	0.2
MW-170M2	05/19/2011	N	SW8330	Hexahydro-1,3,5-Trinitro-1,3,5-Triazine	ND	0.023	0.2
MW-170M2	05/19/2011	N	SW8330	Nitrobenzene	ND	0.03	0.2
MW-170M2	05/19/2011	N	SW8330	Nitroglycerin	ND	1.2	4
MW-170M2	05/19/2011	N	SW8330	Octahydro-1,3,5,7-Tetranitro-1,3,5,7-Tetrazocine	ND	0.0087	0.2
MW-170M2	05/19/2011	N	SW8330	Pentaerythritol Tetranitrate	ND	3	10
MW-170M2	05/19/2011	N	SW8330	Picric Acid	ND	0.026	0.2
MW-170M2	05/19/2011	N	SW8330	Tetryl	ND	0.059	0.2

Notes:

µg/L = microgram per liter

N = primary field sample

MDL = method detection limit

ND = not detected above the RL

RL = reporting limit

Analytical data validated according to the project Quality Assurance Project Plan (QAPP; Tetra Tech, 2012). Associated data packages and data validation reports accessible on the Massachusetts Military Reservation Electronic Data Management System (EDMS).

## **APPENDIX A**

## PROJECT NOTE

### Client, Project and Location:

Impact Area Groundwater Study Program  
Former K Range Chemical Monitoring Network  
Camp Edwards, MA

**Subject:** Former K Range Groundwater Monitoring Discontinuation

**Date:** January 15, 2013

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### PURPOSE

The purpose of this Project Note (PN) is to document agency concurrence with the discontinuation of groundwater monitoring activities associated with the Former K Range, as recommended in the Draft Former K Range Interim Environmental Monitoring Report, Sampling Year 2012, dated August 2012.

### Chemical Monitoring Optimization

As stated in the Draft Former K Range Interim Environmental Monitoring Report, groundwater monitoring results for 2012 show that well MW-170M2 continues to be free of range-related contamination. These findings are consistent with past results where no explosives or significant perchlorate detections have been reported in 13 consecutive sampling rounds dating back to the inception of sampling in 2001. Based on the consistently observed absence of range-related groundwater contamination, the IAGWSP recommends that all groundwater monitoring activities at the Former K Range be discontinued. This recommendation is consistent with the selected remedy for the Former K Range, as described in the *Final Decision Document Former A Range, Former K Range, and Gun and Mortar Positions, September 2012*.

### CONCURRENCE

Concurrence with the recommendations presented in this project note are represented by the signatures below:

 1/17/13

USEPA Representative

 1/17/13

MassDEP Representative

 1/17/13

IAGWSP Representative